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AUTHOR Natale, Joseph L.
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ABSTRACT

This chapter of "Principles of School Business Management" discusses the effective management of purchasing processes in a school district. These processes include obtaining materials, supplies, and equipment of maximum value for the least expense, and receiving, storing, and distributing the items obtained. The chapter opens with an overview of the principles, ethics, and methods of purchasing, and of the use of standardized lists to facilitate bidding processes. The chapter next addresses procurement procedures. Basic procedural principles, alternative ways of characterizing the steps in the procurement process, and statutory requirements are considered. The administrative aspects of the procurement process are the chapter's next topic, including (1) the purchasing official's authority within the context of the district administrative structure; (2) the establishment of written policies, regulations, and guidelines for the purchasing process; and (3) the integration of budgeting and recordkeeping functions with purchasing processes. The chapter then turns to warehousing and distribution, touching on the location of supply storage and the essentials of inventory control. The chapter concludes with a treatment of purchasing from a systems approach; functional and organizational analysis, system management, and the use of a system manual are covered. Relevant sources are cited in 29 notes. (PGD)

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18
School District Purchasing

Joseph L. Natale

Purchasing is not an exact science. It is a practical science and is one of the most highly specialized activities in school business administration. It is a term used to describe the activities related to obtaining materials, supplies and equipment that are required to operate schools and serve educational programs. The purchasing process is considerably more than "buying." It includes: receiving, storing, maintaining inventories and distributing. It seeks to obtain maximum value from each educational dollar provided for equipment, supplies and contracted services. The procedures used may vary depending on the district's size.

The Procurement Function

There is no "absolute" purchasing system applicable to all school districts. A system that works well in one district may not be effective in another district. Effective management of the purchasing function requires controlling the quantity and quality of educational supplies needed for the various educational programs.

Principles of Purchasing According to the Literature

Purchasing has become a major function in educational resource management. It involves the processes related to providing the materials necessary to operate the educational programs and facilities of the school system. Purchasing involves the expenditure of a great deal of funds and requires adherence to principles and methods of good management.

The procurement function does not operate in isolation but, instead, is "an integral part of the administrative milieu."[1] Management of the purchasing operation requires working closely with other departments and administrative units in developing a positive relationship with other school functions. The progressive view of purchasing may be described as that which "is coordinated with other phases of the school's activities, neither subordinate nor dominant, but working closely with other departments toward an optimal educational program."[2] Supply management, as it is sometimes called, involves ordering, bidding, purchasing, warehousing, distribution and accounting.[3] It may be viewed as a service function which "involves the management of materials in flow, from the establishment of sources and shipping through inventory and warehousing to the ultimate delivery at educational stations."[4]

In general, the objectives of purchasing are to buy materials, supplies and equipment of the right quality in the right quantity from the right source at the right price at the proper time. One must strike a balance between the quality of a product and service with the economics of that product and service. Quality may be defined as

" . . . the sum or composite of the properties inherent in a material or product."[5]

According to Hentschke, "Much of the theory in supply management has stemmed from trying to answer two basic questions: how much to order at one time, and when to order it."[6]

The Bureau of Business Practice discusses the value of purchasing as the "result of the relationship between the price paid for a particular item and its utility in the function it fills."[7]

Once the quality of a product has been determined, it will be necessary to decide on the quantity to be purchased. According to Condoli, "Purchase quantities must maintain a balance between current educational needs and the advantages of volume buying."[8] It is important that the procurement program of a district provide adequate quantities of material of acceptable quality in a timely manner that will provide for the educational needs of the various school programs.

Ethics of Purchasing

School personnel authorized to make purchases for the school district as well as other staff engaged in the purchasing operation must maintain high ethical standards of conduct. The reputation of the district is reflected through the practices of the district's purchasing official. A Code of Ethics should be developed to guide the acts of purchasing and the district's methods of doing business.

Roe emphasizes the importance of reputable business practices in school districts.

> The purchasing function is considered one of the most touchy jobs in public service. When it is performed fairly, judiciously, and with good management techniques, few people outside the purchasing department concern themselves with it. Let any questionable practices come to light, however, and the public spotlight focuses with ruthless intensity upon the total organization. Mismanagement in purchasing can throw an entire organization into turmoil and disrepute.[9]

The importance of a municipality's ethical conduct in managing its purchasing program is emphasized by the development of a "Model Procurement Code for States and Local Governments" by the American Bar Association. A final draft of this code was approved in February 1979. The Jefferson County Board of Education, Louisville, Kentucky, later adopted the use of Model Procurement for its purchasing program. A major achievement resulting from that program, "the creation of vendor and public confidence in a system they can understand."[10]

The Association of School Business Officials International (ASBO) developed a Code of Ethics which provides guidance in carrying out the purchasing function. Briefly, the ASBO Code of Ethics pledges the individual's actions to be:

1. Best for pupil.
2. Fair to all concerned.
3. Designed to build good will and better understanding.
4. Based upon respect for the past, knowledge of the present and concern for the future.
5. Legally and morally right.
6. Loyal to my associates, to my school district, to my state or province and country, and to my conscience.
7. The best that I can perform."

The New York State Association of School Business Officials adopted the following code of ethics for school purchasing officials:

1. To consider first the interests of the school district and the betterment of its educational program.

2. To endeavor to obtain the greatest value for every tax dollar expended.

3. To be receptive to advice and suggestions from colleagues, both in the educational field and in other departments of business administration, insofar as such advice and suggestions are not in conflict with legal or moral restrictions in purchasing procedures.

4. To strive for knowledge of school equipment and supplies in order to recommend items that may either reduce cost or increase the efficiency of the means of education.

5. To insist on and expect honesty in sales representation whether offered verbally or in writing, through the medium of advertising or in the sample of a product submitted.

6. To give all responsible bidders equal consideration and the assurance of unbiased judgment in determining whether their product meets specifications and the educational needs of the district.

7. To discourage the offer of, and to decline, gifts which in any way might influence the purchase of school equipment and supplies.

8. To accord a prompt and courteous reception, insofar as conditions permit, to all who call on legitimate business missions.

9. To counsel and assist fellow school purchasing officials in the performance of their duties whenever occasion permits.

10. To cooperate with educational, governmental and trade associations in the promotion and development of sound business methods in the procurement of school equipment and supplies.

A code of ethics combined with school regulations and adherence to various statutes will provide the groundwork for a respectable and reputable purchasing operation. A high ethical standard of conduct results in a reputation for the district and purchasing official above any suspicion of unfair dealings.

Methods of Purchasing

There are several methods of purchasing available to school districts. Variations will be necessary to accommodate differences in the laws of the state and policies of the district.

Before engaging in the purchasing of various goods and services for the school system, the purchasing official must become familiar with the state laws, rules and regulations of the State Education Department, and local policies and regulations

governing purchasing in the public sector, particularly educational institutions. Many states and local districts have rules and regulations requiring competitive bids for purchases beyond a stipulated amount. Also, some states have available state purchase contracts with various vendors and state agencies at given prices for use by local school districts.

The examples below reflect eleven methods of purchasing. For purposes of categorizing various methods, it will be assumed that any purchases over a given amount will require competitive bidding.

Orders Below $5,000. Purchases may be made in the "open market," using price lists or informal quotations from vendors. The purpose of obtaining quotations is to secure the best available value for the tax dollars invested, discover where a given item can be obtained, when delivery will be made and, at the same time, to be fair to vendors. Quotations may take the form of telephone quotes or written quotations. The former is the least desirable and should only be used when an urgent need exists. At least three quotations should be sought and filed with the purchase decision.

The greatest number of individual purchases by the school district is for items costing less than $5,000. The procedure for such purchases may vary in detail depending on the dollar value of the item purchased. To go through the same procedure for a five dollar order as for a $1,000 order may result in a waste of both time and money.

Orders in Excess of $5,000. State law requires that all purchases necessitating the expenditure of more than $5,000 for a stated "item" within a given fiscal year shall be advertised and awarded on the basis of formal bids. This method involves compliance with state law which requires public advertising, competitive bidding and the award of the contract to the lowest responsible bidder.

Courts have held that trade-in allowances must be treated as an expenditure. For example, a district planning to purchase a new piece of equipment at a gross cost of $3,100 and anticipating a trade-in allowance on old equipment at $600, would have to advertise for bids notwithstanding that the net price was less than $3,000. In determining the low bid, the net price is considered.

State laws generally provide for an exception to the bidding requirements in the case of a public emergency arising out of an accident or other unforeseen occurrence or condition whereby circumstances *affecting the life, health or safety of the inhabitants* of a district require immediate action. Situations of this kind must be such that they cannot reasonably be foreseen in time to advertise for bids.

State Contracts/State Agencies. When state contracts or agencies are used, purchase orders are issued directly to the contractors without the necessity of the district securing bids or quotations, since the state has already taken competitive bids or made and/or supplied the items through various agencies such as the state corrections department.

Public Work Contracts. State law requires public works contracts exceeding $7,000 to be awarded to the lowest responsible bidder. This method is applicable to items and projects which require both materials and labor. Included are such projects as construction, paving and printing.

Cooperative Bidding. Two or more school districts may join together in an agreement to make purchases through competitive bidding on a cooperative basis. This has been done in New York State with Boards of Cooperative Educational Services, as well as with other districts on such items as milk, bread, ice cream, general supplies, paper supplies and audio-visual equipment and supplies. Cooperative purchasing agreements generally must have the approval of the board of education of each participating school district.

Government Surplus. State laws permit the purchase of surplus and second-hand supplies, material or equipment without competitive bidding from the federal government, the state government, or from any other political subdivision or district. Such purchases from a private person or corporation are subject to competitive bidding if the cost is over $5,000.

Professional and Personal Services. Some statutes have been judicially construed as having no application to contracts for professional services or for services requiring special skill or training. For example, contracts for legal, medical, dental, nursing or engineering services are not subject to competitive bidding requirements in most states.[12] Some professional or special services which have been held to be excluded from bidding requirements include: purchases of insurance policies, investment management services, laboratory service, ambulance service contracts, public accountant and preparation of a tax map.

Monopolies. Where a subject of a contract is controlled by a monopoly and there is no possibility of competition, the courts will not require the empty formality of inviting proposals. Examples of such monopolies would be telephone and electric service.

Petty Cash Purchases. Such funds shall be used for the payment of properly itemized bills of nominal amounts and under conditions calling for immediate payment to the vendor upon delivery of any such materials or supplies or the rendering of any such services. Purchases through cash exceeding ten dollars should be discouraged. Petty cash accounts should be reconciled on standard forms with the business office prior to reimbursement. Requirements of reconciliation should include: 1) signature of person making expenditure, 2) receipt for amount spent, and 3) approval of the person responsible for the fund. Petty cash funds must be operated in accordance with the regulations established by the statutes and regulations of the state and district.

Confirmation Orders. A verbal order, subject to subsequent confirmation by a written purchase order, may be issued only in cases where a bona fide emergency situation exists which can be handled only by this procedure. Prior approval of the purchasing agent is required. Whenever possible, a purchase order number should be given to the supplier and a confirming purchase order issued immediately thereafter. This should be marked "Confirmation," indicating the purchase order number, if one was given. The individual placing such an order should justify his/her action. Such deviation from normal practice have a very limited use. Lack of proper planning should not be considered a valid reason for this process.

Blanket Orders. Blanket purchase orders or open end accounts may be issued to various vendors for purchase of those items considered to be of an immediate need. Prior approval of the purchasing agent is required for such orders. The purpose of a blanket purchase order is to eliminate the necessity for the issuance of separate orders for groups of items which are purchased frequently from the same vendor. Examples include: food supplies for home economics classes and plumbing sup-

plies for the maintenance department. The period of time covered by a blanket purchase order, as well as the amount and names of authorized individuals, is determined by the purchasing agent. The department must maintain a record of purchases to ensure they do not exceed the amount allowed by the blanket purchase order. In addition, when supplies are delivered or picked up, receipts, delivery slips or other documents must be obtained and the blanket purchase order number should be placed on the documents. These documents will be attached to the receiving copy of the purchase order and forwarded to the purchasing agent at the end of the period for which the blanket purchase order was issued. If, however, the amount allowed is reached prior to this time, the covering documents should be forwarded to the purchasing agent and a new blanket purchase order requested.

Figure 18:1 depicts some of the methods of purchasing utilized in a school district and those positions having responsibility for various tasks.

Standardized Lists

Standardized lists of supplies and equipment can be helpful to the district by facilitating the competitive bidding process and avoiding a lot of special order type items.

Burrup lists the following benefits of standardization:

1. Allows lower costs from bids on large quantities of one item.
2. Reduces and facilitates repairs and replacements.
3. Reduces inventories, thereby reducing storage costs, and at the same time increases the amount of school funds available for other purposes.
4. Speeds delivery of materials or equipment.
5. Reduces the number of materials and equipment for which specifications must be written.
6. Reduces the work of the purchasing department, including that of business office record-keeping.[1]

When developing standardized lists, the personnel concerned must be involved in determining the standards and specifications of the items.

Some states also allow for a school district to standardize on a specific kind of equipment or supply by having the board of education of that district adopt by at least a two-thirds vote of its members, a resolution indicating the need for standardization. This does not, however, eliminate the need for competitive bidding but permits the purchase of a specific make and model. Some reasons for such standardization may include interchange ability of parts or matching of existing furniture. Examples may include school buses and microcomputer equipment.

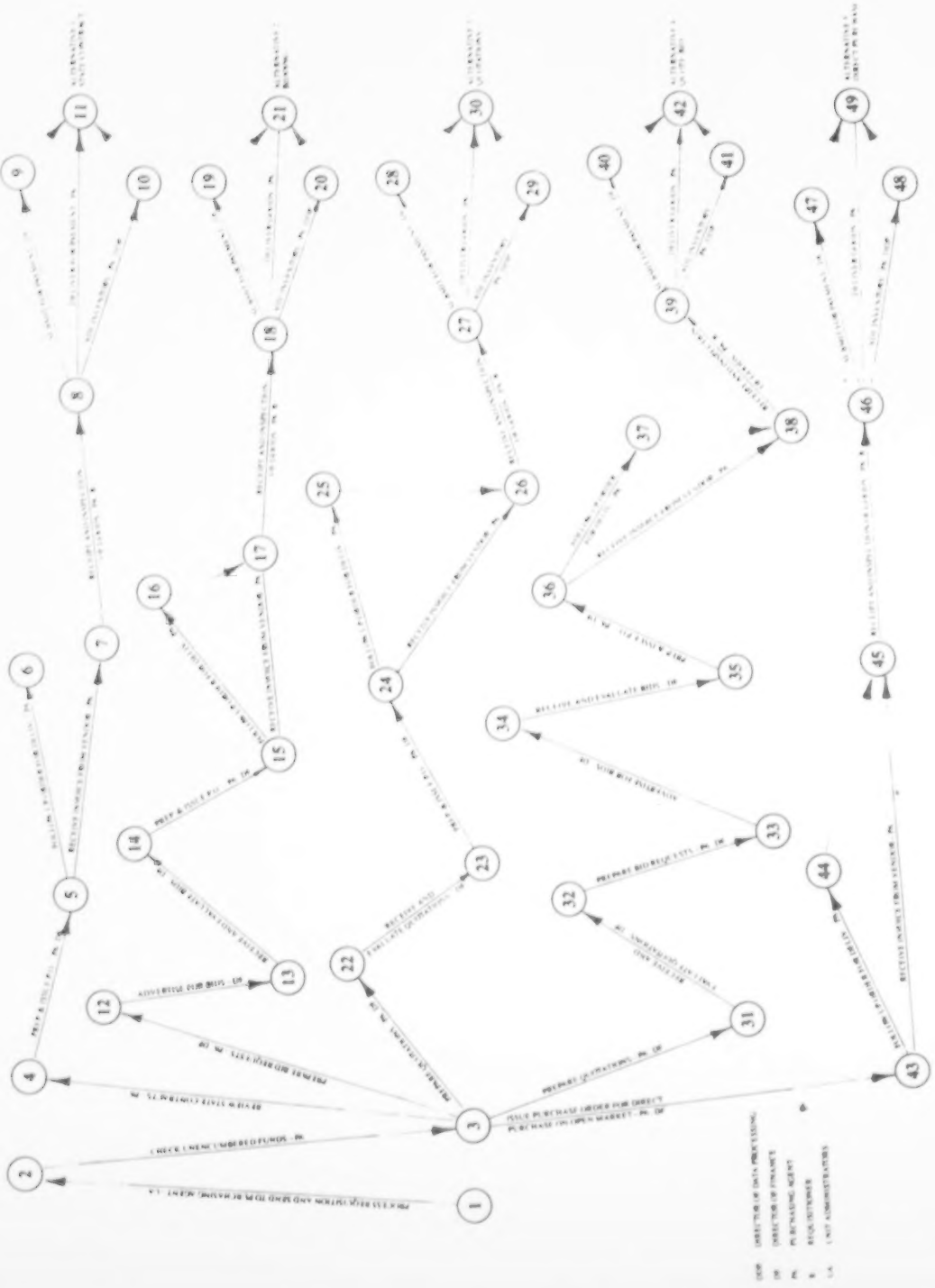

Figure 18:1 Activities Related to Purchasing and Lines of Responsibility

Procurement Procedures

The purchasing process is not an isolated management function of the business office but involves close working relationships with other departments of the school district. The staff needs of various teachers in various departments at various grade levels must be taken into consideration. Communication must be open among the users of the materials, various school officials and various vendors.

Fundamental Concepts

Procuring supplies and equipment goes beyond the simple process of placing an order with a vendor. Burrup and Brimley explain the process of purchasing:

> Involved in the complicated process of purchasing are such problems as determining what is needed and in what quantity and quality, synchronization of the time of need and the time of delivery, providing the quality of the product needed without overspending the amount budgeted, storing what is required withtout keeping too much money in vested in inventories, keeping unsuccessful bidders happy when they cannot complete successfully, and satisfying school personnel when recommended brands of items are not purchased or deliveries are late or some other reason prevents delivery of essential materials or equipment.[14]

A purchasing manual developed by the Kentucky School Business Officials Association and Kentucky State Department of Education lists four basic principles of procurement.

1. Buy the quality standard for the purpose required.
2. Have the product or service available at the time and place requested.
3. Purchase on the most feasible and economical basis.
4. Purchase from the lowest responsible bidder meeting the required specifications.[15]

The California Association of Public School Business Officials lists the following procedural principles:

1. Accomplishment of definitive objectives in the shortest possible time and the easiest manner consistent with accuracy and efficiency.
2. Simplification of tasks to speed operations and reduce potential for error.
3. Establishment of procedures that are definitive and understandable, and will eliminate friction, duplication and confusion.
4. Place responsibility for each step of performance.
5. Establishment of procedures that are flexible enough to allow for expansion as the district grows.
6. Provide a purchasing system that is economical and consistent with the job to be done.
7. Ensure that the procedures are adequate to carry out the tasks for which they were developed.

One of the terms heard often in the management world is accountability. In the public school sector accountability is being demanded by taxpayer groups, boards of education, state and federal legislative bodies. Burrup and Brimley relate the demand for accountability to the procurement function:

> The direct charge of accountability now being emphasized in education may well start with the purchasing and procurement of school materials. It is among the first of the school's business operations to be studied and improved when the sometimes insistent pressure of public opinion is directed toward economizing school business operations.[16]

Saunders explains the role that accountability plays in promoting public confidence:

> Purchasing is public business; and only by establishing procedures which provide full disclosure and open competition will it be considered above reproach by both the public and business community.[17]

Accountability has encouraged the purchasing department to develop procedures that result in a more cost effective and controlled operational system.

Steps in the Purchasing Function

Differences in the size of a school system, various state laws and regulations and administrative organizational structure may necessitate variations in purchasing ing procedures. It is not possible to establish an "absolute" system of purchasing procedures for all school districts. Procedures that work well for one district may be inadequate or too complex for another district.

Condoli summarizes the fundamental objectives for a purchasing department as follows:

1. To plan a program of educational materials and equipment procurement that will optimize the educational output of the system.
2. To maintain continuity of supply to support the educational program, with the minimum in inventory consistent with educational need, safety and economic advantage.
3. To avoid duplication, waste and obsolescence of materials and equipment.
4. To maintain standards of quality in relation to suitability of use.
5. To acquire materials and equipment at the lowest cost consistent with quality and service required.
6. To help the educational system maintain maximum instructional efficiency at all times.[18]

The procurement function is generally considered to cover the complete supply transaction beginning with the recognition of a certain need and ending with the approval of a claim voucher for payment. The following ten steps describe in detail the school procurement process:

1. *Recognition of a Need.* The first step in the purchasing process begins when someone in the district recognizes a specific need for a supply, equipment item or type of service. This could be anyone in the district—teacher, principal, aide, clerk or custodian.
2. *Processing of Requisitions.* Requisitions to supply a specific need are initialed by the user (teacher, principal, custodian or stockroom clerk) and forwarded to their supervisor for review and approval.
3. *Preparation of Specifications.* Before an order is placed or a quotation requested, the purchasing official must describe what is desired in order that prospective vendors may intelligently quote prices and fill orders.
4. *Request for Bids or Quotation.* The purpose of obtaining bids or quotations is to encourage competition in the procurement of supplies, equipment and services. It also allows the discovery of what a given item will cost, where it can be obtained most economically and when delivery will be made. Rec-

ommendations will be made to the board of education on formal bids.

5. *Issuance of Purchase Order or Award of Contract.* Purchase orders are signed by the purchasing official and issued from the purchasing office, subject to the purchasing policies of the district. All contracts which require public advertising a competitive bidding must be awarded or rejected by resolution from the board of education. Certified checks and bid bonds received from unsuccessful bidders should be returned. A regular purchase order is then issued after award by the board of education.
6. *Follow-up of Order for Delivery.* The purchasing official has the responsibility for following up contracts and orders to expedite delivery. The requisitioner should be kept advised as to the status of the requisition and purchase order. Contact with vendors should be limited to the purchasing official only.
7. *Invoice from Vendor.* When the invoice and/or claim form is received from the vendor, the purchasing official should review it to verify that the price agrees with quotations or contract figures and the terms of the order, including f.o.b. shipping or delivery point.
8. *Receipt of Goods.* Upon receipt, goods should be checked for condition and for quantity and quality as stated in the purchase order or contract. This is accomplished by having the requisitioner send the receiving copy of the purchase order and the packing slip to the purchasing office as evidence of receipt of goods and materials. Each of the items must be signed by the administrator and have indicated on the document "received and accepted." In the case of partial orders, a signed packing slip will suffice. If the order is not acceptable, notify the purchasing office.
9. *Quality Control.* Items should be tested for conformity with specifications based on needs or use.
10. *Approval for Payment of Invoice or Claim.* The final step in the purchasing procedure is the approval of the invoice or claim for payment, either by the board of education or the internal auditor. Prompt payment of claims could mean taking advantage of discounts which resulting in substantial savings.

In order to properly execute these basic steps in the purchasing process, it may be necessary to develop as a part of the purchasing system some general operating procedures. The following are basic procedural statements which could appear in a purchasing operations manual:

1. Only the person designated by the board as purchasing agent may commit the district to a purchase.
2. The materials, equipment, supplies and services to be purchased shall be of the quality required to serve the function in a satisfactory manner, as determined by the requisitioner and the purchasing agent.
3. It is the responsibility of the requisitioner to provide an adequate description as required by the purchasing agent, so that he or she may be able to prepare the specifications and to procure most expeditiously and economically the desired commodity and/or service.
4. It is the responsibility of the purchasing agent to make alternate suggestions to the requisitioner if, in the judgment of the purchasing agent, the specifications would restrict competition or otherwise preclude the most economical purchase of the required items. In the case of disagreement, either party may refer the matter in accordance with established procedure.

5. When a low bidder proposes an alternate as "an equal" to that specified, it is the responsibility of the purchasing agent to determine whether the proposed substitution is, in fact, an equal. Such decision shall be based on his or her evaluation and that of the requisitioner. In the case of disagreement between the requisitioner and the purchasing agent, either party may refer the matter in accordance with established procedure.
6. Each building should designate a person to act as building purchasing contact to whom all correspondence and inquiries should be made from both within the building and from the purchasing office.
7. Once items are delivered to the building, the security of those items becomes a building responsibility.
8. All correspondence with vendors regarding placement and status of orders will be handled by the purchasing office. No orders are to be picked up by individuals without prior authorization of the purchasing office.
9. To the extent possible, the purchasing department will try to adhere to a bid calendar in which various categories of purchases will be planned at designated times throughout the school year. This will provide for cyclical purchasing in which certain items can be purchased off season when prices may be lower and deliveries more complete and accurate.

The steps and procedures are a part of a total purchasing system developed to accomplish the necessary transactions to obtain the needed supplies, services and equipment as quickly, accurately, economically and efficiently as possible.

Statutory Requirements

The authority for school district purchasing is granted through statutory laws of the state and rules and regulations of the various state departments such as the state department of education and the department of audit and control. Local district policy also governs purchasing practices of the local district. Such laws and regulations concern such things as limits on bid amounts, advertising requirements, collusion statements and tax exemptions. Purchasing officials must familiarize themselves with the various statutory requirements before committing the district to any goods and services.

Purchase orders become contracts for the purchase of materials under stated terms and conditions and contracts serve as legal documents for obligations between the parties. The purchasing official should consult with the school board's attorney on the purchasing procedures and requirements so that the purchasing function is conducted within the scope of federal, state and local laws and regulations.

Administration of the Procurement Process

The purchasing official for the school district must deal with all aspects of the district, both educational and non-educational. This requires close work and coordination with various levels in the school system's administrative organization and requires the purchasing function to be integrated with all phases of the school operations. Throughout the procurement process, decisions must be made on such matters as quality, quantity, price and source.

Establishment of Authority

The organizational relationship of the purchasing official to all other school

administrators must be clearly delineated and the scope of authority of the person clearly defined and understood. The local school board should designate by formal resolution the purchasing agent of the district. In many cases this is the same individual responsible for the administration of the business affairs of the district, such as the school business administrator. In large districts it could be a separate designated full-time position responsible to the school business administrator. The designated individual is the only employee with authority to contract for supplies, equipment, and services of the district. Only orders for goods and services that have been approved by the purchasing agent become obligations of the district and give rise to a claim against the school district. It is upon the authority of his or her signature that a purchase order becomes approved and issued, thereby creating a district obligation.

The purchasing transactions of a school district must be centralized to provide for control and efficiency of operation. Systems and procedures must be developed that provide an efficient means for being responsive to the various needs of the different departments in the organization, and at the same time provide the necessary control for managing the funds of the district. "Purchasing efficiency in institutional and governmental administration helps to make the materials dollar go farther, thereby either reducing the necessity of raising additional funds by taxation and appropriations or releasing available funds for an extension of services."[19]

Burrup & Brimley define the measure of efficient purchasing in an organization as "having a particular item in the right place at the right time, having been procured at a fair price."[20] The purchasing agent of the district must provide for an efficient operation through his knowledge of marketing conditions and needs of the district's programs.

The Act of Purchasing

In order to provide for an efficient procurement operation with the proper authority and delineation of responsibility, it is necessary to have written policies establishing the procedures used in purchasing of goods and services for the district. Written policies provide for a systematic process built around established procedures. Local policies in conjunction with state and federal law and various regulations of state departments provide the framework for an operation in which the purchasing agent can exercise professional judgment in administering his duties and responsibilities for the procurement of goods and services of the district. These policies may then be developed into districtwide procurement regulations and guidelines. Some of the areas for which guidelines should be provided are listed in table 18:1.

TABLE 18:1
Purchasing Systems Manual Table of Contents

I. THE PURCHASING FUNCTION
Introduction
Purchasing Guidelines
Methods of Purchasing
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Purchasing Procedures
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Preparation of Purchase Orders
Cancellation of Purchase Orders
Outstanding Purchase Orders
Special Item Requisitions
End of Year Transactions

Purchasing Guidelines

1. The purchasing agent is appointed by the board of education and is responsible for developing and administering the purchasing program of the school district.

2. Competitive bids or quotations shall be solicited in connection with all purchasing whenever possible. Contracts shall be awarded to the lowest responsible bidder complying with specifications and with other stipulated bidding conditions.

3. The purchasing agent is authorized to issue purchase orders without prior approval of the board of education where formal bidding procedures are not required by law, and when budget appropriations are adequate to cover such obligations.

4. All purchase contracts for materials, equipment or supplies involving an annual expenditure over $5,000 and all public work contracts involving expenditures over $7,000 shall be awarded on the basis of public advertising and competitive bidding. The purchasing agent (or other designated person) is authorized to open bids and record the same pursuant to law.

5. All contracts which require public advertising and competitive bidding shall be awarded by resolution of the board. Recommendations for the award of all such contracts shall be submitted to the board by the purchasing agent.

6. Residence or place of business of local bidders may be a consideration only in cases where identical bids have been submitted.

7. Purchases shall be made through available state contracts of the Division of Standards and Purchasing through the State Office of General Services whenever such purchases are in the best interest of the school district. Also, purchases of prison-made and blind-made products may be purchased through the appropriate agencies without competitive bidding.

8. Items commonly used in the various schools or units thereof shall be standardized whenever consistent with educational goals and in the interest of efficiency or economy.

9. Petty cash funds shall be established annually in accordance with the regulations of the board and the Commissioner of Education.

10. The purchasing procedures employed shall comply with all applicable laws and regulations of the state and Commissioner of Education.

11. A statement of "General Conditions" shall be included with all specifications submitted to suppliers for their bids. These general conditions shall be incorporated in all contracts awarded for the purchase of materials, equipment and supplies.

12. Opportunity shall be provided to all responsible suppliers to do business with the district. To this end the purchasing agent shall develop and maintain lists of potential bidders for the various types of materials, equipment and supplies. Such bid lists shall be used in the development of a mailing list for distribution of specifications and invitations to bid. Any supplier may be included in the list upon request.

13. No board member, officer or employee of this school district or their families shall be interested financially in any contract entered into by the board of education.

Management of Purchasing

In order for the purchasing process to be initiated, an appropriation for the requested goods and services must be available. This requires the integration of the budgeting function with the purchasing function. The budget development process must provide for educators to plan their program needs in such a manner that they are reflected in the various budgetary appropriations. The budget becomes the financial plan for the education program and should strike a balance between 1) the educational needs of the school system and its ability to support those needs and 2) the quality of goods and services and the economics of those goods and services.

Once the budget is approved by the district, the purchasing of supplies, equipment and services reflected in the budget appropriations is initiated. The purchasing agent will be responsible for the coordination of the implementation phase of the budgeting process which includes the purchasing function. The budget becomes a management tool for planning, organizing and controlling district operations which includes the purchasing process. In order to achieve the necessary controls the budgeting system must be integrated with the district accounting system.

Encumbrance accounting is a procedure which provides for control of budget expenditures by reserving funds for various district purchase orders. It obligates a portion of an approved budget appropriation for purchase commitments made by the district. Once payment is made for the goods, the encumbrance is adjusted to reflect the actual expenditure. This provides the purchasing agent with current information on the status of various budget appropriations.

The National Association of School Business Officials in its *Purchasing and Supply Handbook*, outlines the following procedures for maintaining adequate budgetary and accounting control:

1. All purchases should be based on purchase orders initiated by those having appropriate authority.

2. Purchase orders should be approved through one central office by those having appropriate authority.

3. Purchasing practices should be reviewed periodically in order to disclose inequities.

4. Incoming merchandise should be controlled by the preparation of a receiving report.

5. Vendor invoices should be mailed directly to the account department for verification with the purchase order and receiving report.

6. Invoices should not be recorded as a liability until properly approved.

7. Adequate separation of accounting, purchasing and receiving duties should be provided.

8. Prompt payment of vendors' claims is necessary.[21]

The purchasing procedures of a district and the approved budgetary appropriations must be coordinated and monitored as part of the budget administration process.

Program cost accounting may be accomplished by developing a coding system. The level of detail is based on the needs of the district. The code may be designed so that a portion of it could represent the functional area of expense such as instruction or transportation. Another part could indicate the object of expense such as supplies, equipment or salaries. Also, a location may be designated representing for example the high school, middle school or central office. Program coding can be a means for costing out a given instructional program such as mathematics or industrial arts. Further enhancement of the coding structure can provide an initiator designation for indicating the individual having authority to initiate requests for purchase. The extent of code development is limited only by one's imagination and a district's processing capacities.

The following fifteen digit code could incorporate the various concepts:

f u n c t i o n o b j e c t l o c a t i o n p r o g r a m i n i t i a t o r

For example, the code 2110 200 03 1028 16 could represent the following cost accounting:

2110 Regular Day School Instructional Program
200 Audio-Visual Equipment
03 Middle School
1028 Advanced Placement Math Program
16 Director of Mathematics

A more simplified design could be developed for districts not requiring as much detail. For example, in the code 2110 204 06 the object code incorporates the program area and the initiator code is omitted representing the following cost accounting information:

2110 Regular Day School Instructional Program
204 Science Equipment
06 Kathy Elementary School

The size of the district, its administrative organizational structure and various state and local policies and regulations are some of the factors which should be taken into consideration when designing a codification system. The system should also allow for cost analyses and other management reports.

Warehousing and Distribution

Once the ordered supplies have been received by the school district, the purchasing agent must manage the supply storage and distribution processes. Whether a centralized or decentralized supply management operation is utilized depends largely upon the size of the school system.

Supply Storage

One of the first decisions a school system must make is whether to use centralized storage facilities or decentralized site-based storage facilities. Decentralized storage and warehousing allows for the receiving and storing in each individual school of all materials needed by that school. Centralized storage provides a warehouse for receiving and storing of all goods purchased by the district. Factors which must be taken into consideration are the annual consumption of various supplies and the extent of standardization of supplies. There are no definitive factors which clearly indicate when one storage facility is more effective than another.

The Association of School Business Officials discussed the advantages of centralized and decentralized storage in its *Purchasing and Supply Management Handbook*. A summary of the advantages are as follows:

Advantages of Centralized Storage

1. Flexibility of purchasing allows large volume orders to be placed at any time of year thereby providing opportunity for savings in supply expenditures.

2. An adequate and periodic supply of materials can be provided with minimal storage in schools.

3. Purchases can be scheduled to avoid ordering during suppliers' peak seasons, thereby allowing more timely deliveries and minimization of back orders.

4. Adequate inspection and quality control can be maintained in a systematized manner.

5. Centrally controlled supply inventory records can facilitate studies of consumption, price trending, usefulness of materials, standardization, delivery times, demand pattern, and serve as a basis for scheduling purchases.

6. Centralized storage of frequently used supply items combined with a reliable distribution system can eliminate the need and temptation to hoard and stockpile materials thus reducing loss resulting from obsolescence and waste.

Advantages of Decentralized Storage

1. Reduces school district supply costs by reducing or eliminating intra-district deliveries and operating costs of a central warehouse.
2. Reduces administrative and clerical costs for a central warehouse; however, results in more school unit duties for administrative and clerical staff related to processing of orders, inventory and control.
3. Due to limited storage space in school districts, storing large volumes of supplies may not be feasible and it may actually be less expensive to provide limited school storage space than to build a warehouse.
4. Standard purchasing contracts with vendors providing periodic deliveries throughout the year can eliminate the need for a central warehouse. This, in effect, uses the vendors' storage as an extension of the school system's storage facilities.
5. Obsolescence can be reduced by making frequent purchases of supplies delivered directly to the user.

Distribution and Inventory

Once materials and supplies are received at a central warehouse or building sites, a system of distribution is needed to assure the various materials reach the source of need. Plans for the distribution of educational materials should include use of requisitions, flow charts, records of distribution and inventory records. A central store catalog is useful for requisitioning items from a central warehouse. The catalog can be broken down by various categories and incorporate a coding system for use by staff and for purposes of inventory control. When filling orders, items should be properly packaged, identified and accounted for from point of distribution to point of use.

An adequate inventory control system for maintaining records of supplies and equipment is a necessity. Such a system should provide for the maximum utilization of school materials and supplies, as well as avoid delaying or hampering the educational process due to lack of needed supplies.

Condoli lists ten advantages of inventory control:

- Expedites educational planning throughout the system.
- Promotes buying economies by determining needs scientifically.
- Prevents duplication in ordering because it offers a clear picture of present materials available throughout the system.
- Facilitates the exchange of materials and equipment throughout the system.
- Minimizes losses from damage due to transit.
- Reduces losses from mishandling and theft.
- Aids cost accounting and the development of a program budgeting system.
- Aide in cost comparison between and among programs and departments.
- Provides data for perpetual inventories and therefore can lead to reduced insurance costs.
- Minimizes the investment in inventory.[22]

There are two basic types of inventory systems: *perpetual inventory* and *periodic inventory*. The perpetual inventory system provides an up-to-date, continuous

tabulation of materials on hand, thereby reflecting the current stock and distribution status. It is most suited for the centralized storage and warehousing concept. Periodic inventory provides an accurate accounting of stock only after an actual physical inventory count and is most suited for use with annual requisitioning or once-a-year large orders.

The purchasing official must be responsible for safeguarding public funds and hence materials and supplies. Adequate records of supply inventories is strategic to maintaining needed safeguards. Various computer models for inventory control are available and may be used to expedite the process and provide greater efficiency and economy in inventory control, thereby, enhancing the educational program.

Purchasing: A Systems Approach

The purchasing function can be treated as various systematic techniques applied to the procedures and processes involved in the procurement and distribution of educational goods. The techniques may involve computer applications as well as other related mathematical principles and models.

The systems approach provides a methodical investigation and analysis of the various components and processes within the purchasing function. The relationships of various tasks with organizational structure is the basic emphasis in systems thinking. Kershaw and McKeon explain systems analysis as follows:

> Essentially, systems analysis is the comparison of alternative means of carrying out some function, when those means are rather complicated and comprise a number of interrelated elements. Such analysis could often be called "economic analysis," since the aim is to find the best use of one's resources, but the word *systems* is useful in calling attention to the complex nature of the alternatives being compared.[23]

McManama lists five conditions lending themselves to the application of a systems approach:

1. When complex interrelationships are involved which are difficult to manage, especially when things go wrong.
2. When otherwise simple interrelationships occur simultaneously making it difficult or impossible to correct for deviations without stopping the operation.
3. When critical feedback control must occur instantly.
4. When it is imperative to detect *all* of the social consequences of the system.
5. When it appears that the present operation could be improved by introducing any of the above elements.[24]

Functional Analysis

The purchasing function of the school district, which begins with the recognition of a need and ends with paying of an invoice, must be governed by a system of

procedures needed to accomplish the tasks necessary to procure the goods and services, in order to operate efficiently and accurately.

In order to evaluate the efficiency and adequacy of the purchasing operation, one should analyze the processes of each phase of the operation and examine what changes, if any, in procedures would allow the department to function more effectively. The procedures must be designed to fit the needs and organizational structure of the district, recognizing that there is no one specific procedure for all districts.

An analysis of the work flow is helpful in understanding the purchasing processes. Figure 18:2 illustrates the interface between the purchasing processes and budgetary control. Similarly, the bidding and quotation process can be represented in flow chart fashion as indicated in Figure 18:3 to provide information which will assist in the analysis of that process.

Organizational Analysis

The organizational structure of purchasing departments vary with the size of the school system. The efficiency and effectiveness of the purchasing function will depend somewhat on the organization of the operation. The work flow is affected by the organization of tasks and assignment of responsibility. As changes occur in various rules and regulations governing the purchasing operation and as procedures are altered to conform with these changes, the organization of the purchasing operation becomes subject to modification and improvement.

A functional analysis of a supply management system first requires an understanding of that system. According to Hentschke:

> It is a truism that before the operating efficiency of a supply management system can be evaluated it must be "understood." There are many dimensions of supply systems and a number of perspectives from which to view it. For example, attention could be focused on personnel interaction using a social-psychological perspective. A second perspective could be limited strictly to that of the person requesting supplies, in which case all operations not directly involving that individual become obscure. "Understanding" in this context of supply management takes on a highly specific meaning; that is, attempting to comprehend how the supply management system operates *as an information system*.[25]

A linear responsibility or Gantt chart is also useful in analyzing various operating procedures within the purchasing function of a school system. By detailing each task and relating it to specific organizational positions, interrelationships can be seen clearly. Such charts not only illustrate the interactions among different roles, but also distinguish between instructional and business decisions and indicate areas of support available from data processing.[26]

Procurement Systems Management

Incorporating the computer into the purchasing process will improve the efficiency and accuracy of the work flow. Tempkin and Shapiro discuss four ways to tie the computer into the purchasing process:

1. Supply specifications are stored into the computer.
2. Requisition forms are printed by computer from the specification files. Quantity requests from schools are entered into the computer.
3. The computer compiles and totals various items and prints formal "Invitations to Bid."
4. After bids are evaluated, awards are made by entering into the computer the bidder's name, brand and price.[27]

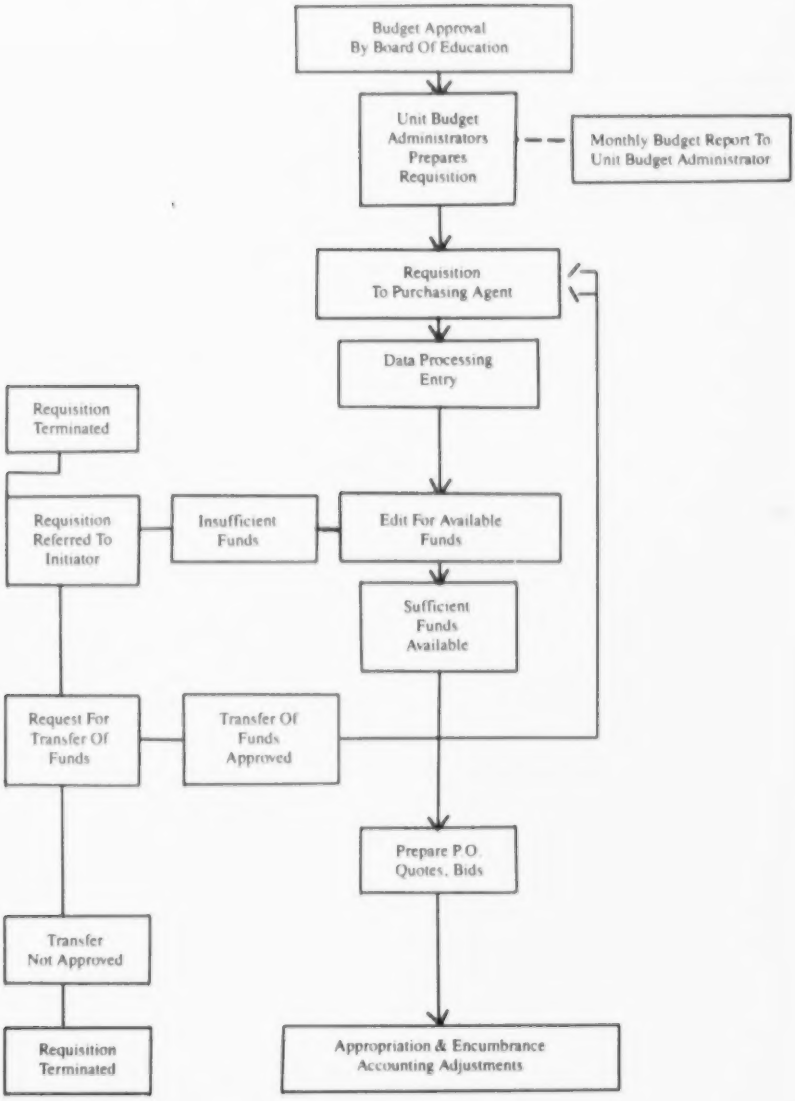


Figure 18:2 Budget Control and the Purchasing Process

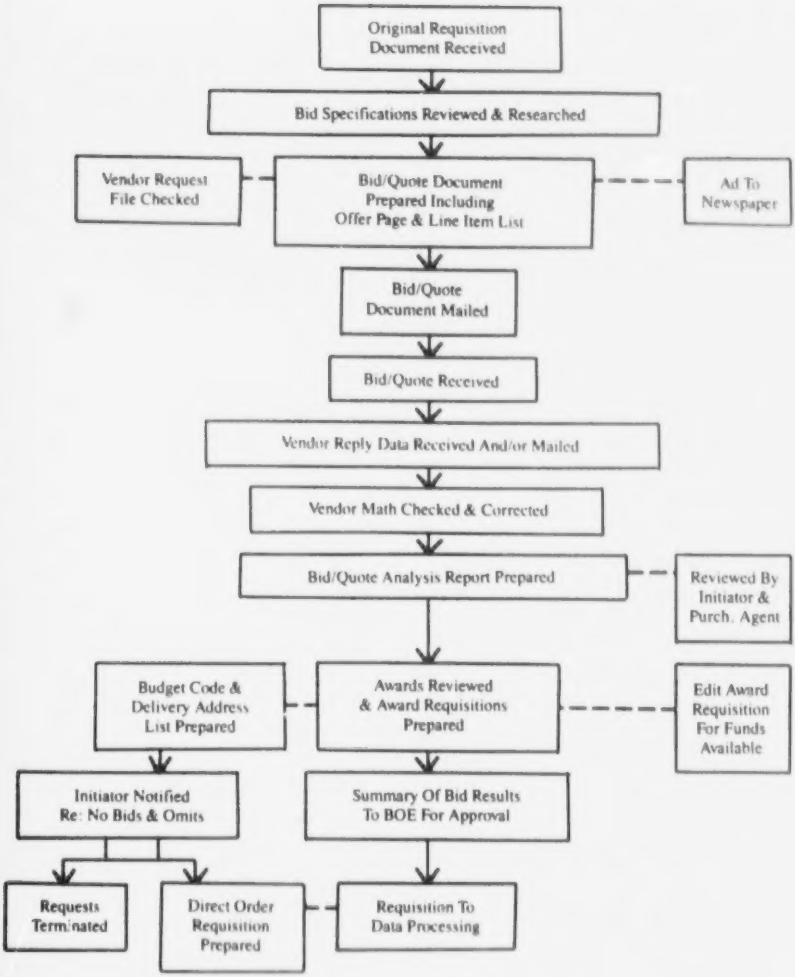

Original Requisition Document Received
Bid Specifications Reviewed & Researched
Vendor Request File Checked
Bid/Quote Document Prepared Including Offer Page & Line Item List
Ad To Newspaper
Bid/Quote Document Mailed
Bid/Quote Received
Vendor Reply Data Received And/or Mailed
Vendor Math Checked & Corrected
Bid/Quote Analysis Report Prepared
Reviewed By Initiator & Purch. Agent
Budget Code & Delivery Address List Prepared
Awards Reviewed & Award Requisitions Prepared
Edit Award Requisition For Funds Available
Initiator Notified Re: No Bids & Omits
Summary Of Bid Results To BOE For Approval
Requests Terminated
Direct Order Requisition Prepared
Requisition To Data Processing

FIGURE 18:3 Bidding and Quotation Process

Once the awards are complete, the total amount of requests for various buildings can be checked against their approved budget appropriations for sufficiency of funds. This links the purchasing function to the budgetary process. When insufficient funds are available, specific orders can be rejected and the requisitioner directed to adjust the order or secure additional funding. Once the appropriations are justified to meet the purchasing obligations, the computer can print up purchase orders for processing.

Systems application utilizing operations research theory can be applied to the purchasing function for developing optimum ordering strategies. Once determinations of the quality of types of goods has been made, the basic supply management decision of how much to order and when to order or reorder must be decided. Decision rules can be formulated such as "when the inventory level of supply item A is at x units, order a new shipment of y units." The optimum economic order quantity and reorder point must be determined.

The determination of optimum ordering quantity requires a mathematical model. In order to illustrate the concept, let us consider a simplified example. Assume a district orders two units of supply item A every two days and that exactly one unit per day will be demanded in the district. Also, the vendor guarantees to the district that time between placement of a new order and receiving of the order (lead time) is two days. The model is based on a uniform known rate of consumption and a constant known lead time. It is, therefore, referred to as an inventory system under certainty. See Figure 18:4.

Since the purchasing agent knows that daily demand is one unit and lead time is two days, there will never be a stockout. That is, the purchasing office will always be able to fill the requisitions by reordering whenever the inventory or stock level is at two units. The new order will arrive in two days when the two units on hand will drop to zero and at the same moment a new order will be received. An alternative policy could be to order twenty units of supply item A every twenty days. Figure 18:5 illustrates this policy.

The policy of ordering two units every two days will require the purchasing agent to place 182.5 orders per year for an annual demand of 365 units. While this results in a high cost for ordering, since more purchases are required, there is a low inventory holding cost, since the amount of inventory is small.

The policy of ordering twenty units every twenty days requires the purchasing agent to place only 18.25 orders per year, hence lowering the annual ordering cost significantly. However, the inventory holding cost will be substantially higher, with ten units being the average inventory as compared to an average of one unit under the first policy.

From the simplified example, it is apparent that low ordering cost is accomplished at the expense of high inventory holding cost and low inventory holding cost is accomplished at the expense of high ordering cost. The objective is to find a minimum cost point between the two extremes referred to as the "optimum order quantity." Determination of the optimum order quantity is a mathematical model involving such factors as unit cost of materials based on size of order, average inventory level, cost of processing a purchase order and cost of holding materials in inventory. The model is developed to minimize the total annual ordering and holding costs.

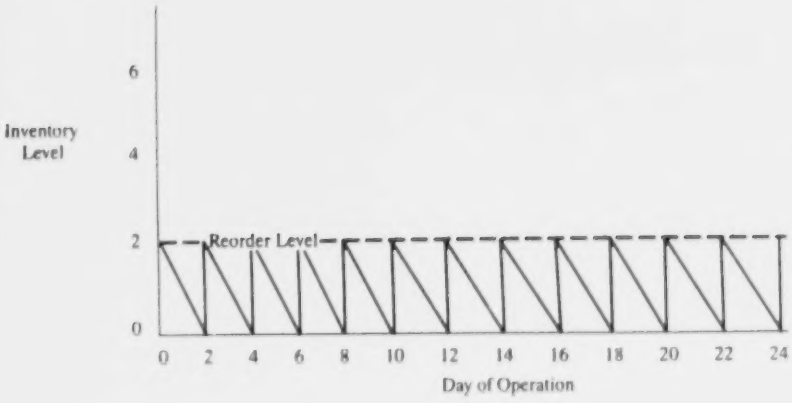
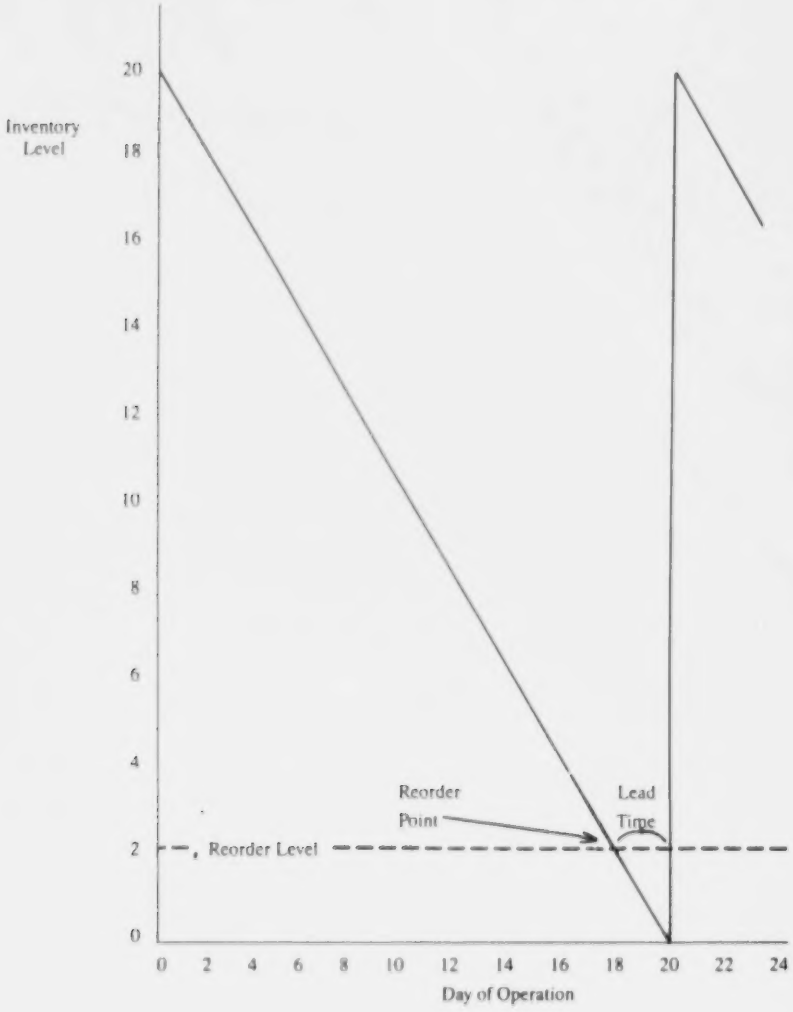


FIGURE 18:4 Inventory Curve Under Certainty Policy (Order Two Units Every Two Days)

FIGURE 18:5

Inventory Curve Under Certainty (Order Twenty Units Every Twenty Days)



Applications of operations research and use of calculus provide a means for developing a general mathematical model for use in determining the optimum ordering quantity.

Condoli provides the following formula for determining the optimum (economic) order quantity:

$$E = \frac{2\,UP}{I}$$

where: E = Economic Order Quantity (in dollars)
U = Annual usage (in dollars)
P = Cost of issuing a purchase order (in dollars)
I = Cost of carrying inventory (as a decimal percentage of value).[28]

A computer program can be developed from this formula and can itself serve as a general model in the same sense as the formula.

This model is based on various assumptions of demand and lead time, thereby enabling decisions to be made with those certainties. However, these assumptions are not always fixed. Demand rate may vary from one day to the next. Lead time between orders often varies and may result in a stock out. As a result, a model must be developed dealing with uncertainty of demand and lead time. Again, operations research and computers can help in developing a viable model that can be used to simulate the operation under the conditions of uncertainty and determine the optimum order quantity.

Purchasing Systems Manual

The purchasing procedures, rules and regulations must be communicated to all levels of the organizational structure of the district. Employees must be informed of the process and given the information needed to effectively procure their various needs and successfully perform their part in the educational organization.

A purchasing systems manual is an ideal way to inform all management staff and other employees of the school district about the district's procurement process. As indicated in the sample Table of Contents which appears in Table 18:1, the manual should include: information about state and local laws, regulations and policies concerning procurement; basic guidelines to follow when using the system; the steps of the procurement process; and purchasing practices and procedures. In addition, it should provide a detailed account of how to use the system and what to do in special situations. Persons responsible for various aspects of the process should also be indicated. The appendices should include a sample of the forms to be used (along with instructions on how to complete them and route them), and a copy of state and/or local written policies.

In addition to providing information and a means of communication, a written manual: provides for standardization of and consistency in policies and procedures; establishes uniformity within the process; and serves as an authoritative reference for management.[29]

In short, the manual represents the promolgation of the district's purchasing function in a single source document. As such, it becomes the written communications link among the school business office, central office administrators and supervisors, building administrators, teachers, vendors, school board and the community with respect to purchasing.

The development of a purchasing systems manual is a major task. Once completed and adopted, it must be maintained and updated to reflect changes in the laws, regulations, policies, procedures and organizational structure. After some use, the manual, itself, may need some alterations in format and content. It is important to remember that the manual is a dynamic and authoritative management tool requiring commitment from all sectors in its maintenance, application and enforcement.

NOTES

1. C.I. Candoli, W.G. Hack, J.R. Ray and D.H. Stollar, *School Business Administration: A Planning Aproach*, 3d Ed. (Boston: Allyn and Bacon, 1982,) 208.

2. Ibid., 203—204.

3. G.C. Hentschke, *Management Operations in Education* (Berkeley, CA: McCutchan Pub. Corp., 1975), 90.

4. Candoli, 204.

5. Ibid., 205.

6. Hentschke, 90.

7. Bureau of Bus. Practice, *Purchasing Agent's Desk Manual* (Waterford, CT, 1984,) 8-1.

8. Candoli, 211.

9. W.H. Roe, *School Business Management* (New York: McGraw-Hill Book Co. 1961,) 126.

10. J. Macaluso, "Model Procurement Code Allows Flexibility in Kentucky School Purchasing Operations," *School Business Affairs* (March 1982,) 17.

11. R.E. Munsterman, *Purchasing and Supply Management Handbook for Sch. Bus. Officials* (Reston: Assn. of School Business Officials, 1978), 49-50.

12. See R.C. Wood, "Competitive Bidding of Architectural Services," *School Business Affairs* (July 1985), 49-51.

13. P.E. Burrup and V. Brimley, *Financing Educ. in a Climate of Change*, 3d ed. (Boston: Allyn and Bacon, Inc., 1982), 365.

14. Ibid., 362.

15. Kentucky School Business Officials Ass'n and Kentucky Department of Education, *Purchasing Manual* (1975), 9-10.

16. Burrup, 362.

17. F. Saunders, Jr. "Accountability: The Big Word in Purchasing," *School Business Affairs* (March 1981), 12.

18. Candoli, 208.

19. Ibid.

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21. Munsterman, 40.

22. Candoli, 221.

23. J.A. Kershaw and R.N. McKeon *Systems Analysis and Education* (Santa Monica, CA: Rand Corp. Oct., 1959), 1.

24. J. McManama, *Systems Analysis For Effective School Administration* (West Nyack, NY: Parker Pub. Co., Inc., 1971), 19.

25. Hentschke, 112.

26. Ibid. See also Table 3: "Linear Responsibility Chart of School District Supply Management."

27. K. Temkin and P. Shapiro, "Computerizing Your Annual Purchasing," *School Business Affairs* (March, 1982), 18-20.

28. Candoli, 211.

29. See A.J. Andrews, *Journal of Systems Management* "Preparing and Using Administrative Manuals" (March, 1980), 15.